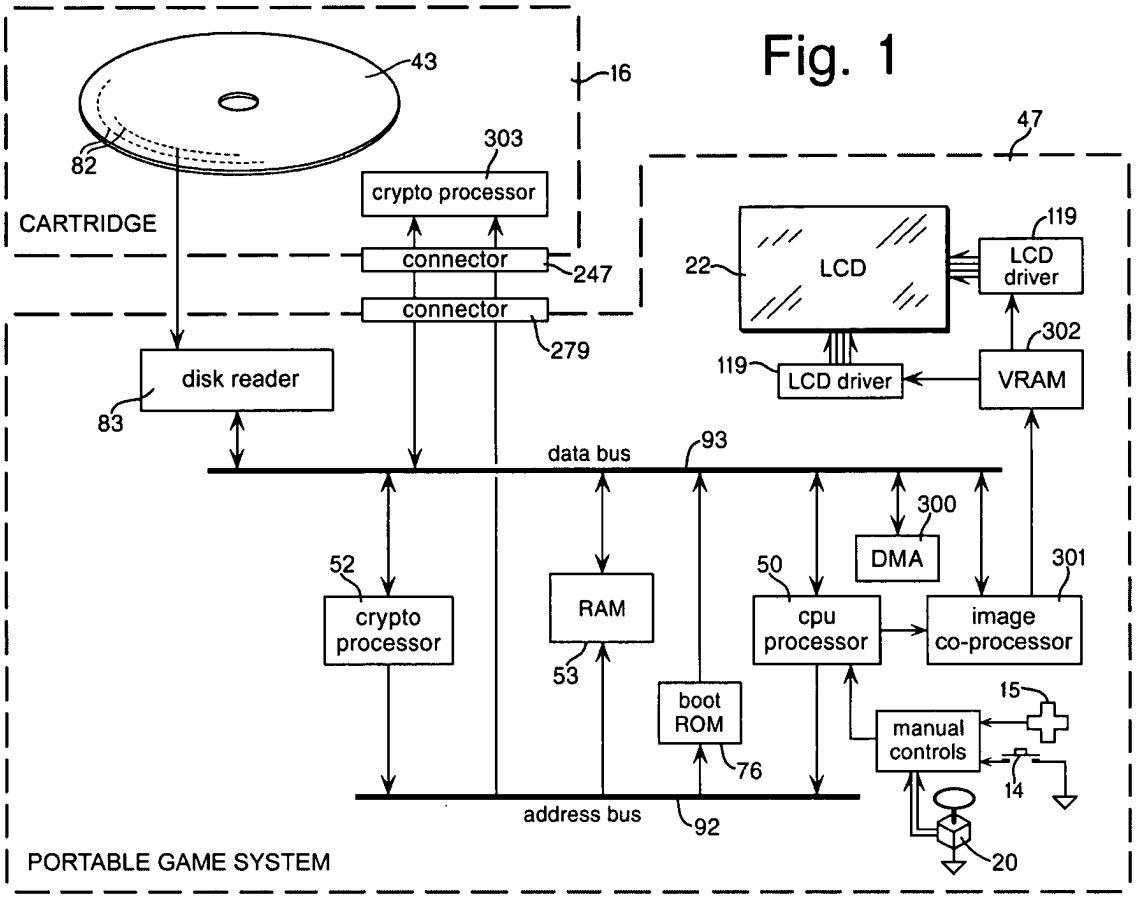

43
16
82
303
crypto processor
CARTRIDGE
connector
247
connector
279
47
LCD
119
LCD driver
22
119
LCD driver
302
VRAM
disk reader
83
data bus
93
300
DMA
301
52
crypto processor
RAM
53
50
cpu processor
image co-processor
boot ROM
76
15
manual controls
14
address bus
92
20
PORTABLE GAME SYSTEM

Fig. 1

Fig. 2

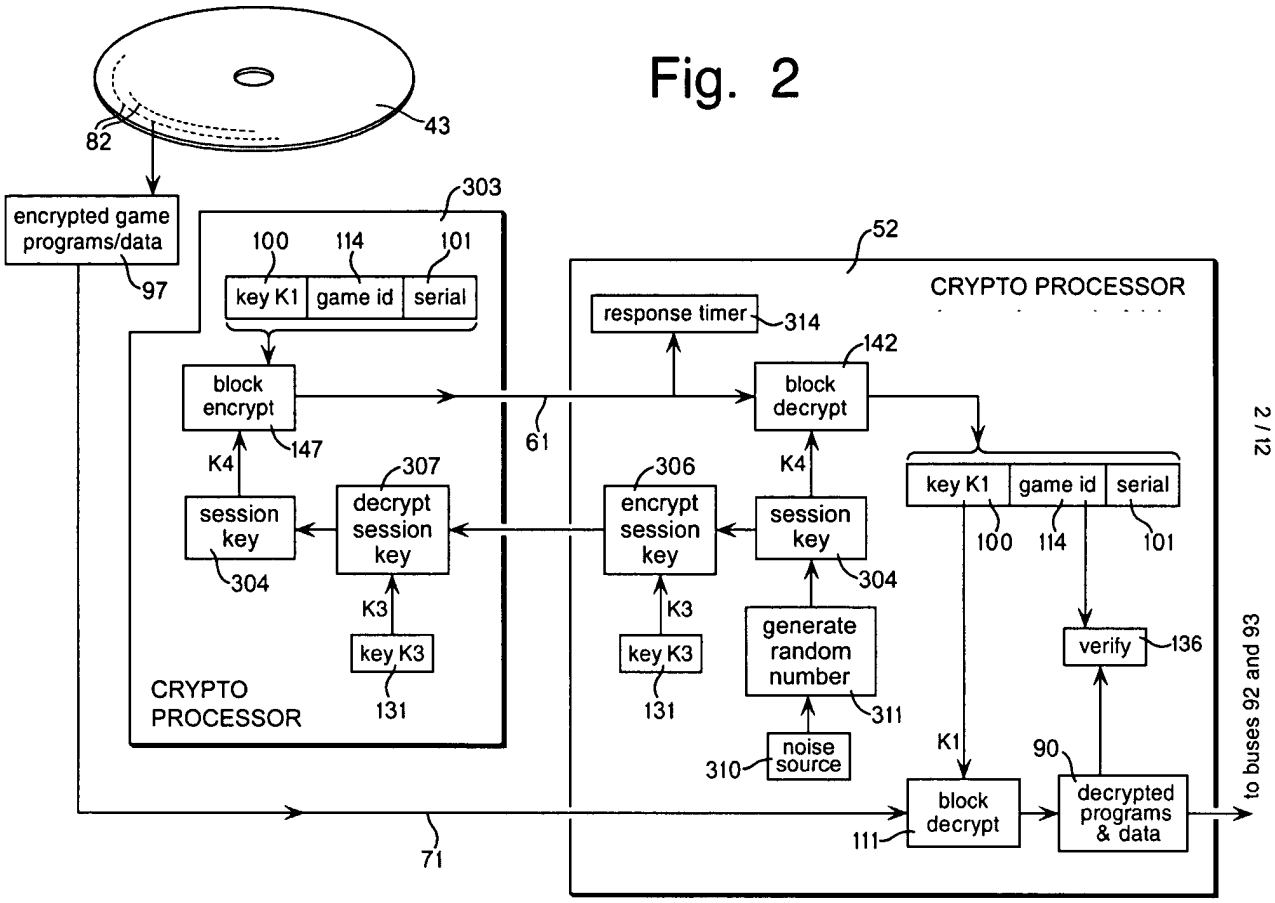

82
43
encrypted game programs/data
97
303
100
114
101
key K1
game id
serial
block encrypt
147
K4
session key
304
decrypt session key
307
K3
key K3
131
CRYPTO PROCESSOR
61
52
CRYPTO PROCESSOR
response timer
314
142
block decrypt
K4
session key
304
encrypt session key
306
K3
key K3
131
generate random number
311
noise source
310
key K1
game id
serial
100
114
101
verify
136
90
K1
block decrypt
111
decrypted programs & data
71
to buses 92 and 93

Fig. 3

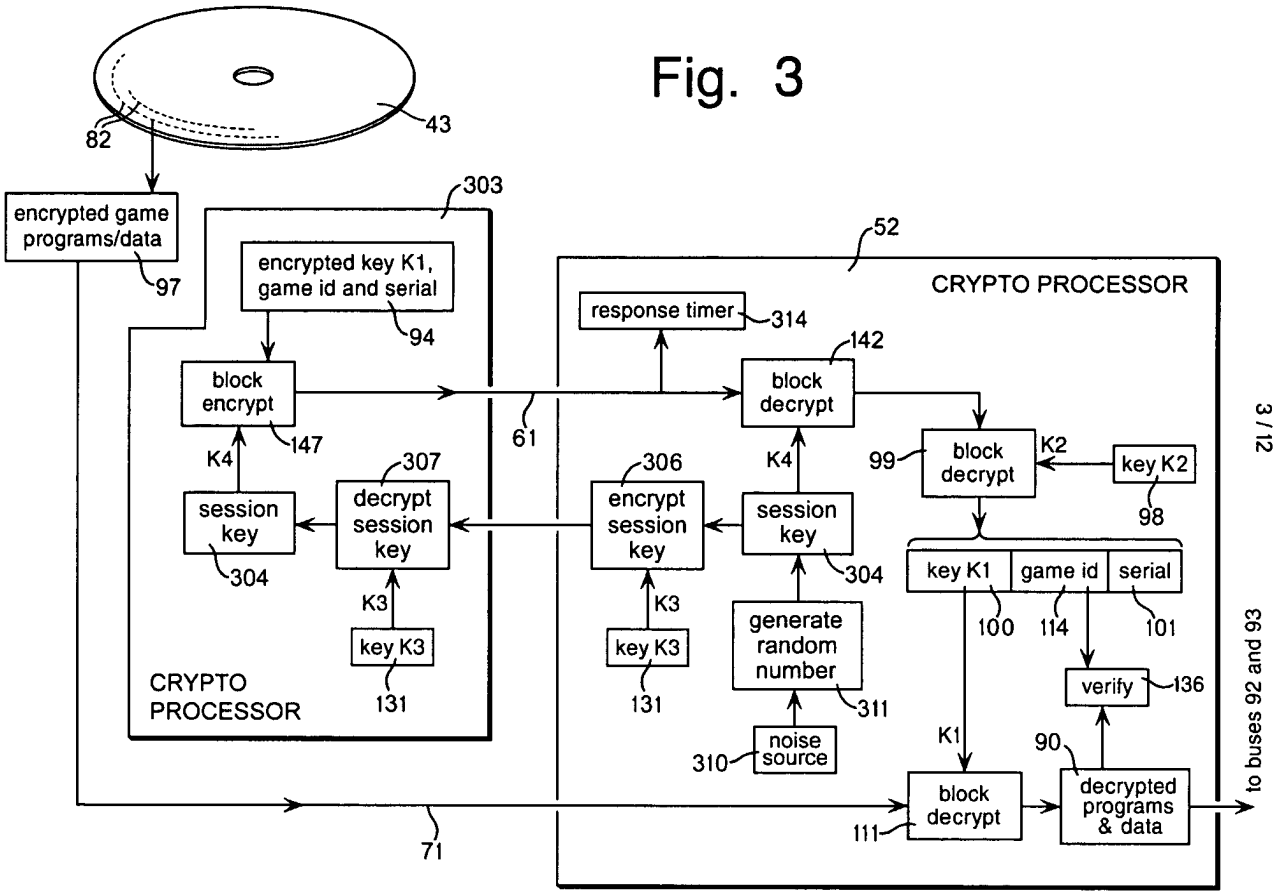

82
43
encrypted game programs/data
97
303
encrypted key K1, game id and serial
94
block encrypt
147
K4
session key
304
decrypt session key
307
K3
key K3
131
CRYPTO PROCESSOR
61
52
CRYPTO PROCESSOR
response timer
314
block decrypt
142
K4
session key
304
encrypt session key
306
K3
key K3
131
generate random number
311
noise source
310
99
block decrypt
K2
key K2
98
key K1
game id
serial
100
114
101
verify
136
K1
90
block decrypt
111
decrypted programs & data
to buses 92 and 93
71

Fig. 4

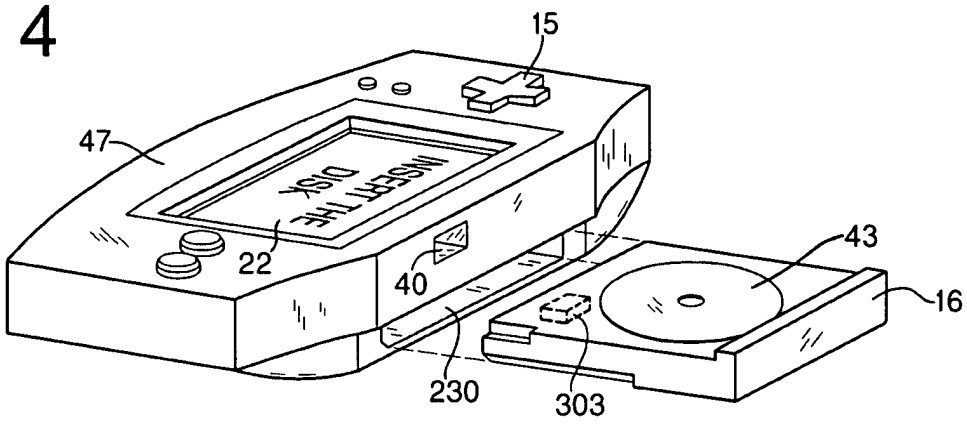
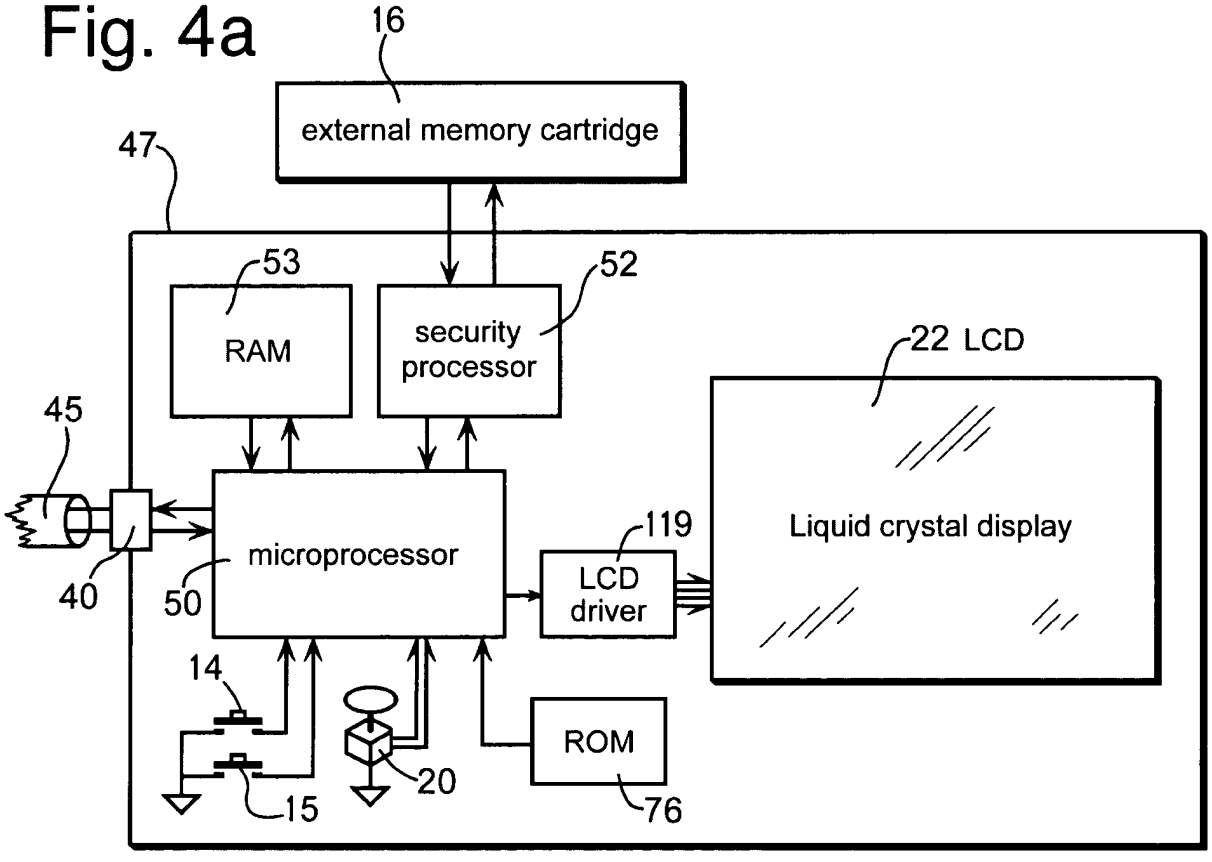

15
47
INSERT THE DISK
22
40
43
16
230
303

Fig. 4a


16
external memory cartridge
47
53
RAM
52
security processor
22 LCD
45
Liquid crystal display
119
microprocessor
LCD driver
40
50
14
ROM
20
15
76

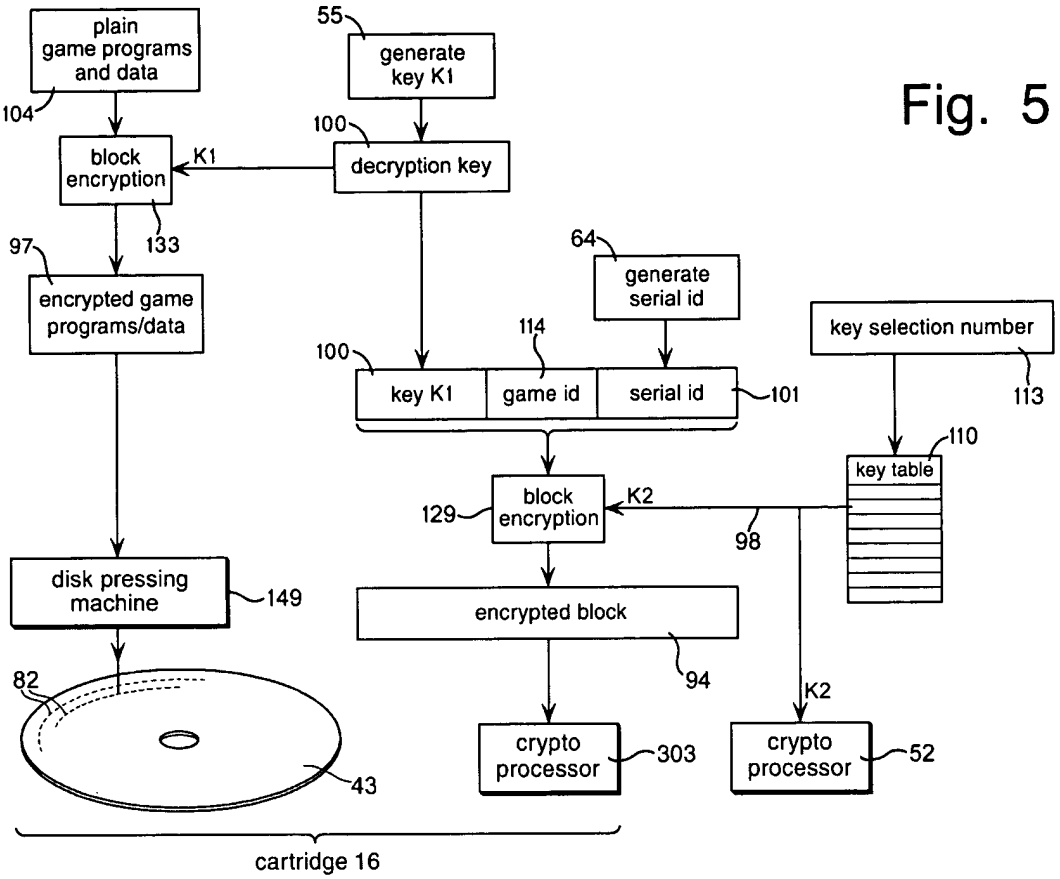

plain
game programs
and data
104
55
generate
key K1
100
decryption key
block
encryption
K1
133
97
encrypted game
programs/data
64
generate
serial id
key selection number
113
100
114
key K1
game id
serial id
101
110
key table
129
block
encryption
K2
98
disk pressing
machine
149
encrypted block
94
82
K2
crypto
processor
303
crypto
processor
52
43
cartridge 16

Fig. 5

Fig. 6

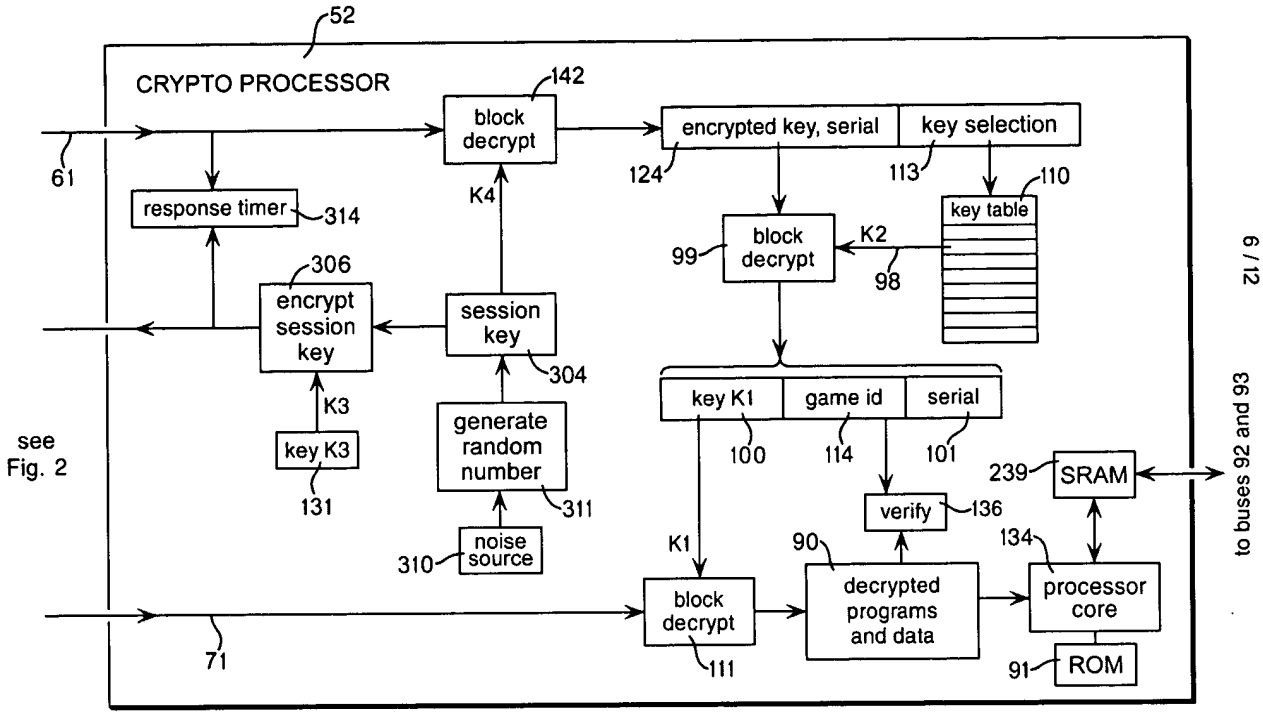

52
CRYPTO PROCESSOR
142
block decrypt
encrypted key, serial
key selection
61
124
113
110
response timer
314
K4
key table
block decrypt
K2
99
98
306
encrypt session key
session key
304
K3
key K1
game id
serial
see Fig. 2
key K3
131
generate random number
311
100
114
101
239
SRAM
verify
136
310
noise source
K1
90
134
block decrypt
decrypted programs and data
processor core
71
111
91
ROM
to buses 92 and 93

Fig. 7

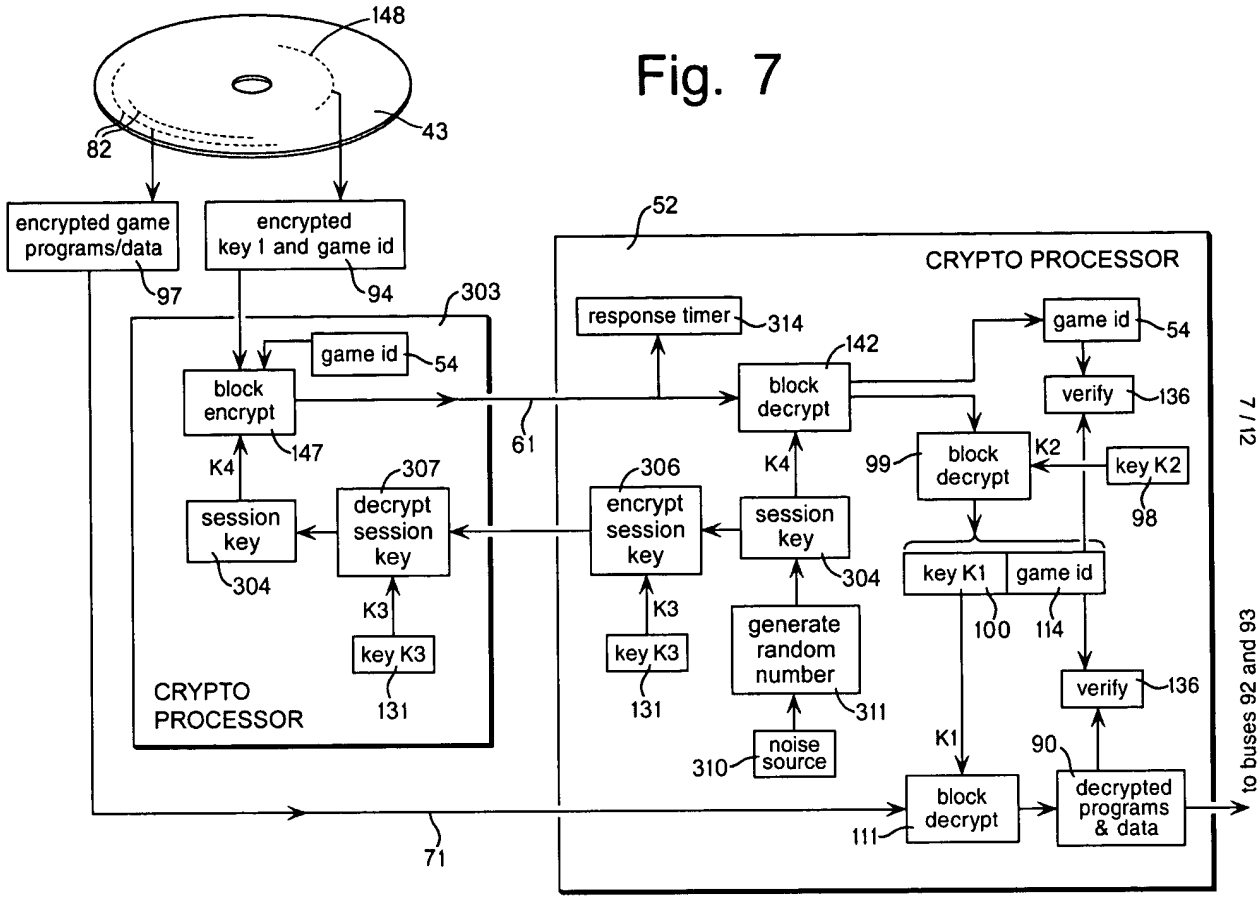

148
82
43
encrypted game programs/data
97
encrypted key 1 and game id
94
52
CRYPTO PROCESSOR
303
game id
54
block encrypt
147
K4
session key
304
307
decrypt session key
K3
key K3
131
CRYPTO PROCESSOR
61
response timer
314
142
block decrypt
306
encrypt session key
K4
session key
304
K3
key K3
131
generate random number
311
noise source
310
game id
54
verify
136
99
block decrypt
K2
key K2
98
key K1
100
game id
114
verify
136
K1
90
111
block decrypt
decrypted programs & data
71
to buses 92 and 93

Fig. 8

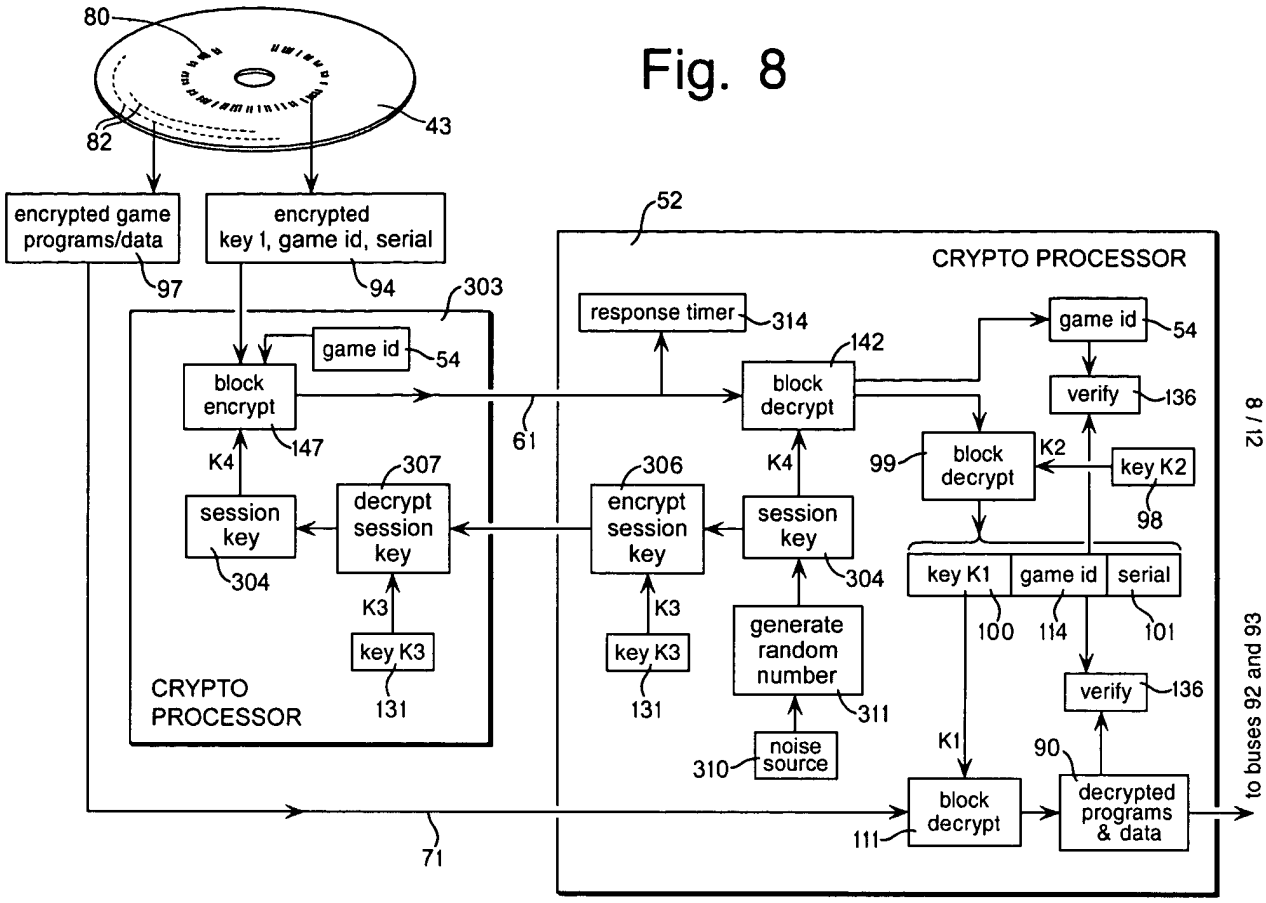

80
82
43
encrypted game programs/data
encrypted key 1, game id, serial
97
94
303
52
CRYPTO PROCESSOR
response timer
314
game id
54
block encrypt
147
block decrypt
142
verify
136
61
K4
307
306
K4
99
block decrypt
K2
key K2
98
session key
decrypt session key
encrypt session key
session key
304
key K1
game id
serial
100
114
101
K3
K3
generate random number
311
verify
136
key K3
131
key K3
131
CRYPTO PROCESSOR
noise source
310
K1
90
block decrypt
111
decrypted programs & data
71
to buses 92 and 93

Fig. 9

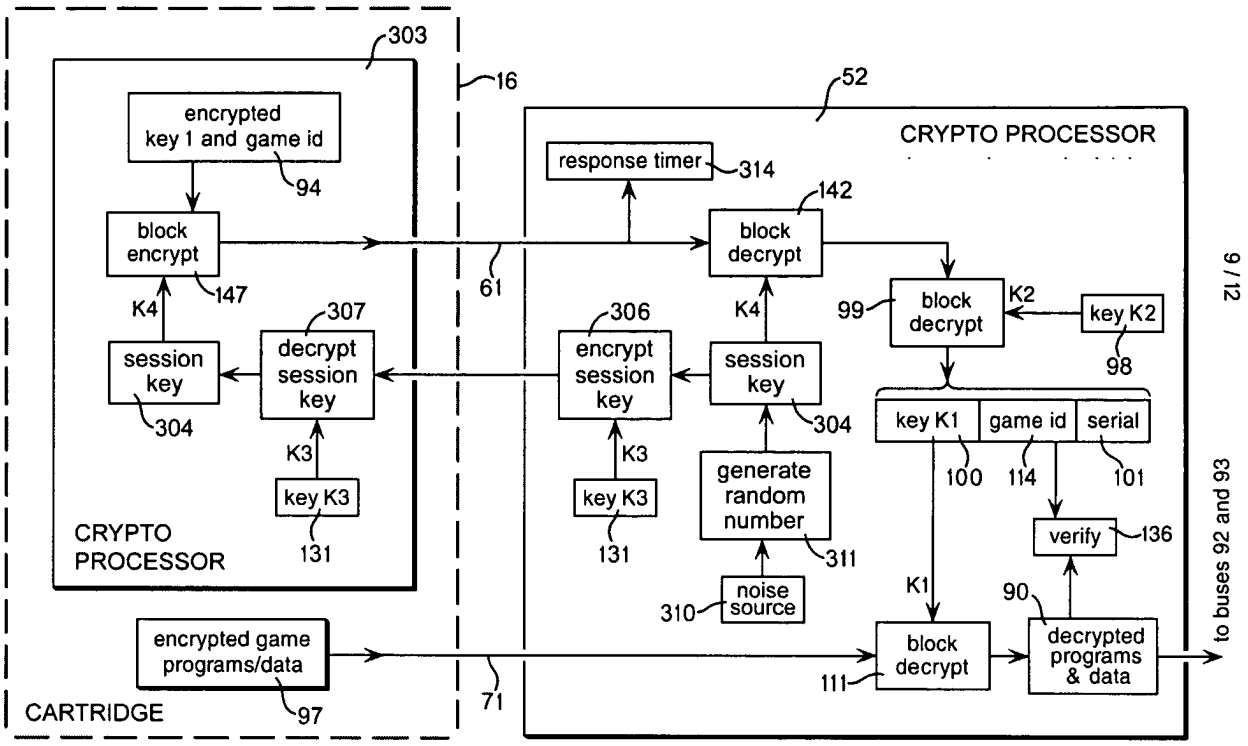

303
16
52
CRYPTO PROCESSOR
encrypted key 1 and game id
94
response timer
314
142
block encrypt
147
block decrypt
61
K4
307
306
K4
99
block decrypt
K2
key K2
98
session key
decrypt session key
encrypt session key
session key
304
key K1
game id
serial
304
100
114
101
K3
K3
generate random number
key K3
key K3
131
131
verify
136
CRYPTO PROCESSOR
311
noise source
310
K1
90
encrypted game programs/data
97
block decrypt
111
decrypted programs & data
CARTRIDGE
71
to buses 92 and 93

Fig. 10

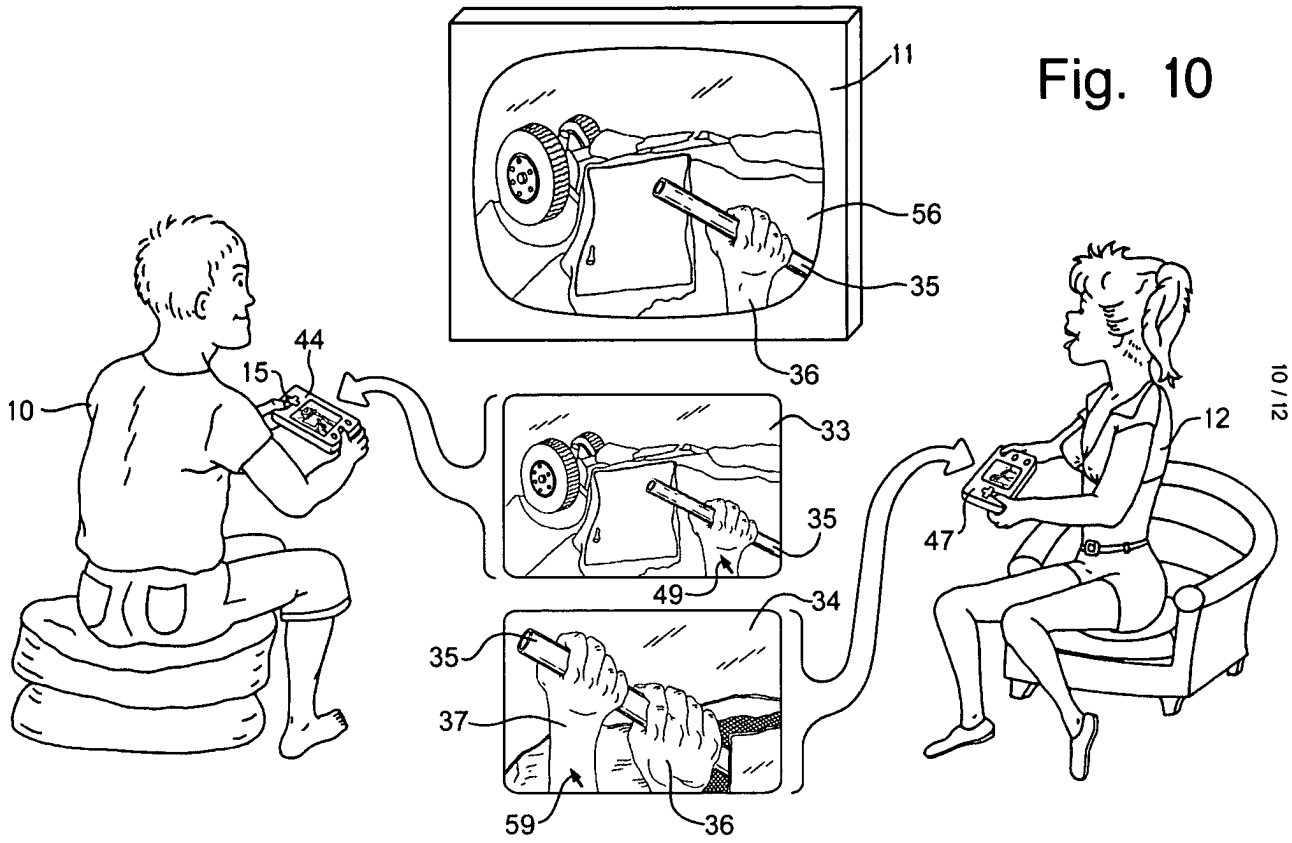


Fig. 11

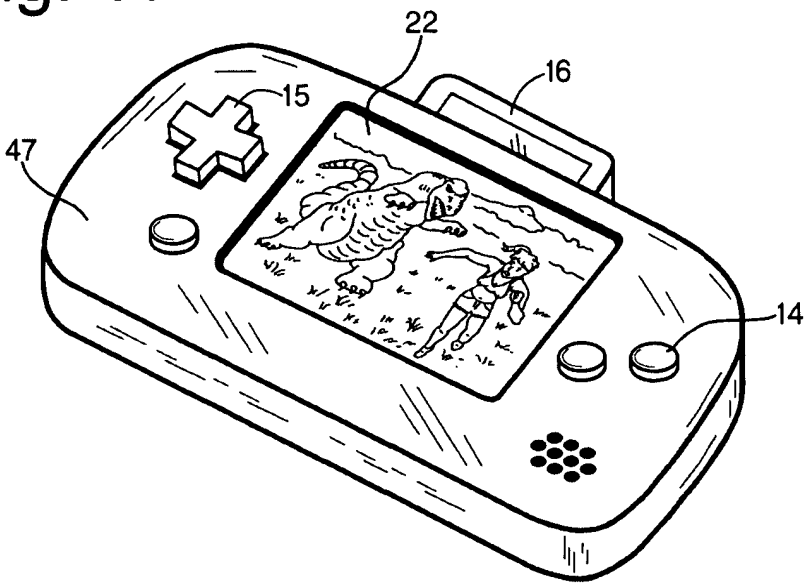


Fig. 12

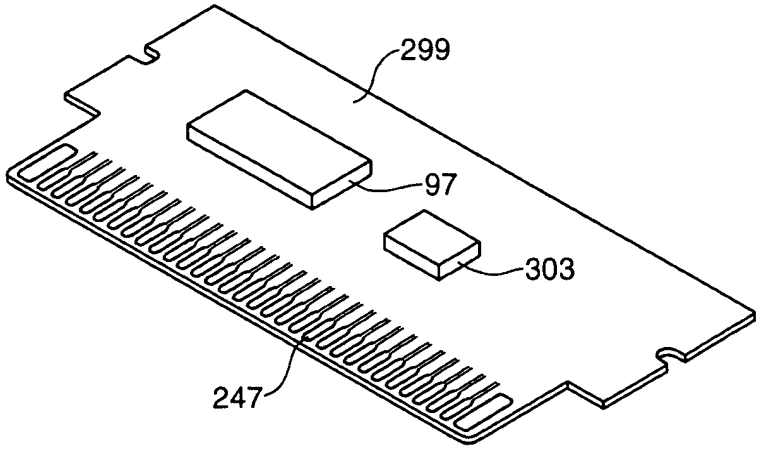


Fig. 13

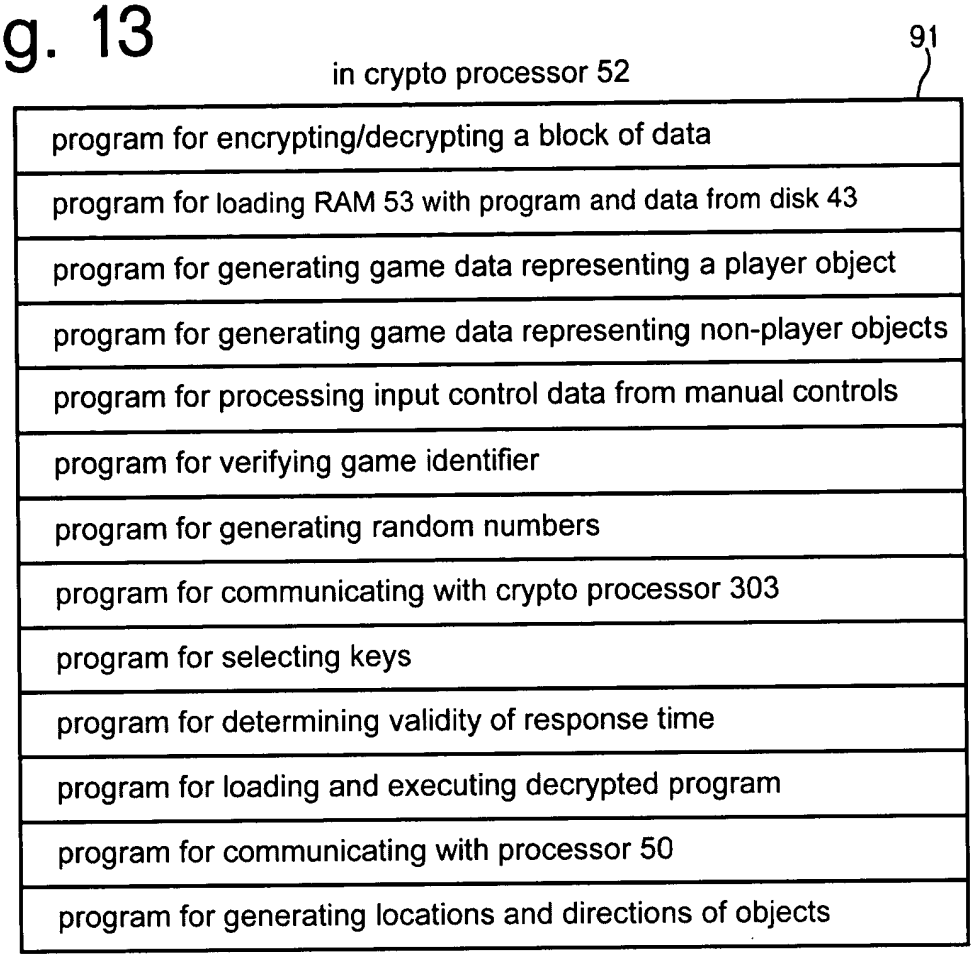
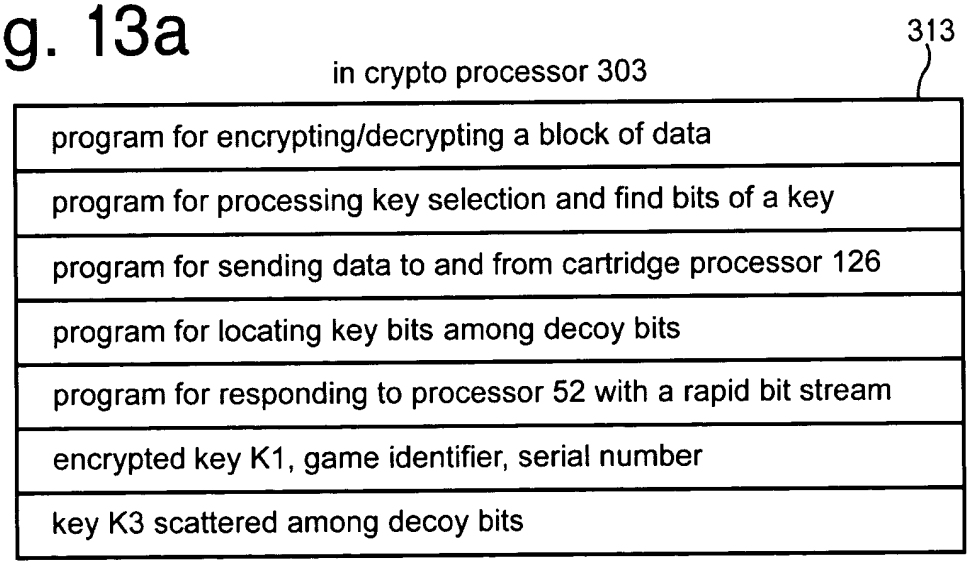



Fig. 13a